The Ohio LSAMP Alliance

Evaluation Report: Year 9-4 (2021-2022) – Annual Student Survey Results
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EVALUATION SUMMARY

The National Science Foundation's Louis Stokes Alliances for Minority Participation (LSAMP) program has the overall goal of increasing the number of underrepresented minority (URM) students who complete degree programs in science, technology, engineering, and mathematics (STEM).[2] The Ohio LSAMP Alliance—comprised of 10 partner institutions of higher learning—initially received funding in September 2013. This marks the initiative's fourth year of a five-year continuation grant, which includes renewed commitment to the overarching goal of doubling the number of URM STEM degree recipients and a heightened focus on strengthening retention, community college to four-year institution pathways, innovative interventions in mathematics curricula, graduate school preparation, and alliance-wide communication. The Ohio LSAMP Alliance uses the term "Level 1" for students officially active in LSAMP and receiving stipends, or who previously had this status. "Level 2" refers to URM students pursuing STEM degrees who have never actively enrolled in the LSAMP program or been eligible for stipends.

This report presents results from the Spring 2022 Annual Student Survey. A total of 403 students (8% of 5,040 invited) completed the survey administered from mid-March through the late May 2022. Of the 343 Level 1 LSAMP Scholars invited, 135 (39%) responded to the survey, representing a nine percent increase in this group's participation over the prior year. All ten partners were represented. Response rates were consistent with prior years. All survey topics and methodologies from the prior-year survey were maintained. Questions covered demographics, GPA, majors, academic integration, math anxiety/efficacy/value, disciplinary socialization, social integration, participation in support activities, and community college and transfer experiences. As in prior years, this report analyzes the differences in program impacts and effectiveness of supports available to active Level 1 Scholars (treatment group) compared to Level 2 Scholars (control group), where applicable. Funded Level 1 Scholars were asked additional questions about their experiences with the LSAMP program, involvement in peer mentoring (as mentor or mentee), and the plans of graduating seniors (graduate school or employment). The survey design aimed to deepen the partners' overall insights into the practices that have the strongest positive impacts on URM students.

[1] Institutional Research Consultants, Ltd. (IRC) www.irc-evaluation.com is an independent evaluation research firm located in central Ohio.
[2] See The Ohio LSAMP Alliance website for additional information https://ohiolsamp.org/.

Findings: Level 1 and Level 2 Comparisons

Participation in Programming and Support Services

The Spring 2022 LSAMP Annual Student Survey results show significantly higher proportions of Level 1 Scholars were active in all 10 programming and support services measured. The results below show the respective percentages of Level 1 and Level 2 active in each component:

- Personal and professional development workshops (73% vs. 28%)
- Faculty mentoring (71% vs. 25%)
- Tutoring/supplemental instruction (SI) in mathematics (68% vs. 29%)
- Tutoring/SI in sciences (67% vs. 27%)
- Peer mentoring (66% vs. 26%)
- Summer bridge/early arrival program (63% vs. 14%)
- ALEKS or other web-based learning system in mathematics (58% vs. 26%)
- Undergraduate research or summer research (47% vs. 22%)
- Graduate school preparation workshops (37% vs. 12%)
- Tutoring/SI in non-STEM courses (36% vs. 15%)

Notably, the Level 1 Scholars increased their involvement in all 10 areas over the prior year, with the largest growth evident in math tutoring/SI (up 25%), faculty mentoring (grew by 14%), and personal/professional development workshops (12% higher). The dramatic growth of Level 1 Scholar participation in components associated with academic success demonstrates LSAMP's consequential impact on these students.

Students overall attributed the greatest impacts on their academic performance to:

- Tutoring/supplemental instruction in math (67%)
- Tutoring/supplemental instruction in sciences (64%)
- Undergraduate research or summer research (59%)
- Summer bridge/early arrival program (58%)

Significantly more Level 1 Scholars than Level 2 viewed tutoring/SI in sciences (74% vs. 51%) and non-STEM courses (58% vs. 36%) as beneficial to their academic success.

The top four factors that encouraged the students' persistence in STEM were:

- Undergraduate research or summer research (65%)
- Personal and professional development workshops (61%)
- Faculty mentoring (61%)
- Summer bridge/early arrival program (57%)

A significantly higher proportion of Level 1 Scholars compared to Level 2 attributed their stronger commitment to their field of study and degree completion to undergraduate/summer research (75% vs. 54%), summer bridge/early arrival program (67% vs. 35%), and science tutoring/SI in science (63% vs. 35%) and math (58% vs.42%).

The top contributors to the respondents' sense of belonging this year were summer bridge/early arrival programs (62%) and undergraduate and summer research (61%). Significantly more Level 1 Scholars attributed participation in a summer bridge/early arrival program (72% vs. 38%), personal and professional development workshops (58% vs. 42%), and tutoring/SI in sciences (36% vs. 21%) to making them feel part of a STEM community.

Undergraduate Research and Professional Conference Attendance

Seventy-seven of the 403 respondents (23%) overall participated in undergraduate research in 2021-2022. Notably, more Level 1 LSAMP Scholars (N=37; 29%) engaged in this vital activity known to strengthen career preparation compared to Level 2 (N=40; 20%). Although the difference is consistent with prior years, the gap just missed being statistically significant this year. Additional overall positive impacts of participating in undergraduate research included:

- 85% affirmed the research experience strengthened their commitment to pursuing graduate degrees in STEM (up 9% over last year)
- 44% presented their research at professional meetings or forums
- 22% had their research results published

Respondents confirmed that participation in undergraduate research helped them acquire new skills, develop professionally, and clarify their interests. The experience also helped some discover that working in STEM or research was not a good fit. Importantly, students affirmed that the undergraduate research experience fostered networking opportunities and enhanced their knowledge and skill sets in data analysis, research, writing, and presenting their results. In addition, significantly more Level 1 LSAMP Scholars attended a professional association conference or meeting during the 2021-2022 academic year (50% vs. 30% of Level 2).

Degree Aspirations

A significantly higher proportion of Level 1 Scholars expected to complete a doctorate (24% compared to 14% of Level 2). Percentages aiming for a master's (28% for Level 1 and 29% for Level 2) and professional degrees (19% for Level 1 and 17% for Level 2) were similar for the two groups. Significantly more Level 1 Scholars (71% compared to 60% of Level 2) were planning to pursue either an advanced or professional degree. In contrast, significantly more of the Level 2 group anticipated that a bachelor's would be their highest degree (31% vs. 16% of Level 1).

Commitment to STEM Major

Of the 403 respondents, 125 (33%) *considered* changing their major during the 2021-2022 academic year; however, the majority (67%) opted to continue in their current STEM majors. Twenty-eight percent (N=35) did switch to a different STEM major while five percent (N=6) changed to non-STEM majors.

Math Anxiety, Efficacy, and Value

Overall, most respondents (81-94%) confirmed the math skills they were learning were relevant to their STEM majors, they could do the hardest math in their STEM courses this semester if they tried, learn the math even if it was hard, figure out how to do the most difficult math problems, master the math skills in their STEM courses and apply the math they learned to future courses. Sixty-seven percent agreed that the math they were learning during the semester was relevant to their lives. Level 1 participants benefitted in the following ways:

- Significantly *more* Level 1 Scholars thought the math they studied was relevant to them (81% vs. 74% of Level 2)
- Significantly *fewer* Level 1 students (31% vs. 44%) worried the demands in classes involving math might be too great for them

A new finding this year is that Level 1 Scholars were significantly more likely to be pursuing a degree in mathematics (8% vs. 3% for Level 2).

Faculty Mentoring

Survey findings continue to affirm the strong positive impacts of LSAMP's faculty mentoring component. Significantly more Level 1 Scholars had faculty mentors in STEM fields (69% vs. 37% for Level 2); this competitive edge was about the same as last year (and represents an increase from 60% in 2019-2020). When non-STEM mentors are included, 75 percent of Level 1 Scholars had access to a faculty mentor, which was also significantly greater than 44 percent for Level 2 respondents.

Overall, 96 percent of the respondents felt their mentors respected them as individuals and 90-94 percent confirmed their mentors had attitudes and values similar to their own, went out of their way to promote the mentee's academic interests, encouraged them to persist in their STEM studies and prepare for future steps, and made them feel they belonged in their chosen fields. Ninety-one percent of Level 1 and 78 percent of Level 2 indicated their faculty mentors shared their career histories with them. This difference, which just missed being statistically significantly for Level 1 students this year (and last year), highlights how LSAMP-involved faculty are able to build stronger personal connections with URM students. Other positive findings that students affirmed concerning their faculty mentors include:

- Served as role models (89%)
- Discussed students' concerns regarding competence, relationships with peers and supervisors or other conflicts (87%)
- Had open conversations about anxiety/fears detracting students from their work (85%)
- Helped students:
    - Explore career options (84%)
    - Meet other people in their field (76%)
    - Finish assignments, tasks, meet deadlines (70%)
    - Improve their writing skills (60%)
    - Develop presentations (55%)
    - Obtain co-author credit on published research articles (50%)

The faculty teaching and mentoring traits and practices that students find most beneficial in the classroom and one-on-one were consistent with survey findings in prior years and include:

- ✓ Inspirational role model
- ✓ Passionate about teaching
- ✓ Offers hands-on activities
- ✓ Answers questions clearly, patiently
- ✓ Gives timely feedback on assignments
- ✓ Gives in-depth explanations of calculations
- ✓ Gets students excited about the material
- ✓ Provides grounded advice and advocacy
- ✓ Facilitates engaging classroom discussion
- ✓ Listens to and incorporates student feedback
- ✓ Understands and supports different modes of learning
- ✓ Reaches out to students to check on their progress and well-being
- ✓ Shows confidence in students even when they doubt themselves
- ✓ Well organized, good listener, tenacious, thorough, dedicated
- ✓ Compassionate, approachable, flexible, kind, attentive, dependable

In addition, an academic integration question revealed that Level 1 Scholars were significantly more likely to report being supported by faculty in their major (90% vs. 81% of Level 2).

Social Integration

Similar to last year's findings, being active in LSAMP significantly benefited Level 1 Scholars on eight of the 16 metrics. Compared to Level 2, respondents in Level 1 felt:

- Other STEM students like them the way they are (94% vs. 85%)
- People in STEM know they can do good work (93% vs. 84%)
- STEM teachers respect them (91% vs. 85%)
- Treated with as much respect as other STEM students (89% vs. 78%)
- Free to really be themselves in STEM (83% vs. 74%)
- People in STEM notice when they're good at something (83% vs. 72%)
- Included in lots of STEM activities (76% vs. 52%)
- Most STEM professors at their schools are interested in them (75% vs. 59%)

Students across-the-board expressed high levels of agreement with numerous social integration items. Most felt they belong in STEM (89%), were treated with as much respect as other STEM students (83%), and other STEM students took their opinions seriously (82%). More than three quarters indicated they could be themselves in STEM (78%) and that people in STEM noticed when they were good at something (77%).

However, student responses overall showed these possibly concerning findings on the negative side of social integration:

- 73% could give the impression they were more competent than they really are
- 63% feared they could not live up to expectations of people praising their accomplishments
- 63% felt very different from most other STEM students.
- 54% agreed it was hard for people like them to be accepted in STEM
- 47% believed their successes had been some kind of error

This year, 33 percent overall reported facing instances of discrimination or bias in STEM classes or activities based on their race/ethnicity. This was more prevalent among the Level 1 group (40% compared to 29% for Level 2, which is consistent with last year when the respective groups were 39% and 27%). It is salient to highlight that Level 1 Scholars include a significantly greater number of Black/African American students. This demographic and enrollment at a four-institution were statistically associated with a higher level of reported race/ethnicity-related discrimination or bias. Being in LSAMP provides Black/African American students and those at larger institutions with a supportive network of peers, faculty, and staff that helps to mitigate their lower sense of belonging in STEM majors.

Community College Students

Fifty-eight respondents (18% surveyed) enrolled at two-year institutions reported on their participation in transfer preparation activities provided *by four-year institutions* and the positive impacts of such activities on their academic performance, persistence, and sense of belonging in STEM. Level 1 Scholars were significantly more likely to have participated in the following three activities offered *by four-year institutions*:

- Mentoring by a peer mentor at a four-year institution (68% vs. 28%)
- Conferences with four-year students or personnel (64% vs. 28%)
- Social activities, receptions, awards dinners, and other events (41% vs. 14%)

One hundred percent of the Level 1 community college respondents who had taken part in undergraduate research on a four-year campus affirmed the experience encouraged their persistence in their STEM major, which was significantly greater than Level 2 (22%). A significantly higher proportion of Level 1 community college students (58% vs. 18% for Level 2) attributed meeting with transfer representatives at the four-year colleges to fostering their sense of belonging in STEM. Overall, both social activities and undergraduate research (57% and 53%, respectively) were the top two factors that helped respondents feel part of the STEM academic community.

Transfer Students

In the 2021-2022 academic year, 29 students (9%) of the 403 respondents reported transferring from a community college to a four-year partner institution, a notable increase from last year (N=19; 5%).

Community college students had positive opinions about transfer preparation activities involving contact with four-year institutions. Overall, half of the students (50%) gave high ratings to the usefulness of meeting with transfer representatives at the four-year institutions and just under half (48%) felt the same regarding review of how their courses/credits applied toward their intended degree program. Forty-one percent rated meeting with transfer representatives at their two-year institutions as beneficial. There were no significant differences between Level 1 and Level 2 ratings on these items.

Most transfer students were satisfied with their interactions with advisors (89%), instructors (86%), and other students (79%). The credit transfer process also appeared to have gone smoothly for the majority (82%), and most respondents were likewise happy with the number of credits that transferred (79%). More than 70 percent overall were pleased with the opportunities to participate in campus activities outside of class time and the guidance provided on financial aid, degree requirements, and navigating campus resources. Being a Level 1 Scholar had a statistically significant positive effect compared to the Level 2 group in four key areas:

- Interactions with advisors (100% vs. 84%)
- Help in understanding financial aid (100% vs. 67%)
- Communication about degree requirements (100% vs. 59%)
- Assistance in navigating resources at their current institution (100% vs. 56%)

Findings: Level 1 Scholars Only

Program Coordinators

The Annual Student Survey results over the past several years have all reinforced the high value of the role LSAMP program coordinators play in the success and overall well-being of Level 1 Scholars. It is salient that a high 91percent reported they felt comfortable discussing their struggles with their respective LSAMP program coordinator. A high percentage of students also affirmed that their respective LSAMP program coordinator engaged in the impactful dynamics and interactions below:

- ✓ 99% encouraged their continuation in a STEM field (up from 96% last year)
- ✓ 95% provided helpful advice on their academic progress
- ✓ 94% was appropriately accessible, directed them to appropriate resources, and advised them about undergraduate research opportunities
- ✓ 91% responded to their emails and phone calls, monitored and reviewed their progress, and advised them about scholarships and financial aid resources
- ✓ 82% advised them on applying to graduate school (down from 88% last year)

The proportion of respondents wanting more time to discuss *academic issues* with the LSAMP program coordinator declined to 51 percent (compared to 59% last year). LSAMP Scholars reporting they would like more time to discuss *personal issues* with their respective program coordinator also decreased to 47 percent (from 53% last year). This decline likely reflects the concerted efforts by LSAMP staff to meet students' expressed needs in these two domains.

LSAMP teams did a remarkable job providing support to students during the pandemic and have adapted well to the "new normal." Although the level of student need for one-on-one guidance and empathetic counseling remains high, the teams deserve commendation for stepping up to this challenge with expanded office hours, advisement, and referrals to mental health resources.

Peer Mentoring

Fifteen (12%) Level 1 respondents were LSAMP peer mentors during the 2021-2022 academic year. All 15 peer mentors engaged in the following dynamics with their peer mentees:

- ✓ Shared personal examples of difficulties they overcame
- ✓ Encouraged mentees to use them as a sounding board
- ✓ Expressed confidence in mentees' ability to achieve their educational goals
- ✓ Provided practical suggestions for improving mentees' academic performance
- ✓ Helped them develop coping strategies when academic goals were not achieved
- ✓ Assisted in identifying strategies for mentees to achieve their academic goals
- ✓ Shared their views and feelings when discussing college-related issues
- ✓ Explained degree and career options to mentees
- ✓ Helped them explore options, provided guidance on attainable academic goals
- ✓ Helped them improve study habits, questioned them about academic progress

Fourteen mentors (93%) also encouraged their mentees to discuss their academic problems and reviewed strategies for balancing school with other responsibilities, and 13 (87%) referred their mentees to university resources for information about their academic plans.

The 31 students (24%) who reported having a peer mentor through LSAMP this academic year affirmed that their peer mentors engaged in these impactful practices:

- ✓ 97% shared their views and feelings when discussing college-related issues
- ✓ 93% expressed confidence in mentees' ability to achieve educational goals, encouraged them to review strategies for balancing other responsibilities with educational goals, helped them identify strategies to achieve academic goals
- ✓ 90% encouraged mentees to use them as a sounding board, referred them to university resources, helped them explore realistic options, provided guidance on attainable academic goals, gave practical suggestions for improving academic performance, shared personal examples of difficulties they overcame
- ✓ 86% encouraged mentees to discuss academic problems, explained degree and career options to them
- ✓ 83% followed up on mentees' efforts to improve study habits by asking questions about their academic progress, helped them develop coping strategies when they fell short of their academic goals

Additionally, 93 percent of the peer mentees affirmed that having a peer mentor helped them gain a better understanding of how to achieve academic success in college, adjust to college life, and feel more confident about completing a degree in STEM. Most (82%) experienced personal growth due to the peer mentor relationship, while 79 percent increased their understanding of how to communicate with faculty and affirmed they made changes or took action based on advice from their peer mentors. Three-quarters (75%) became more involved in STEM-related activities outside of course work due to their peer mentors.

Graduating Scholars

Data from the 21 Level 1 Scholars who confirmed they were graduating seniors showed that LSAMP programming helped to prepare confident STEM graduates with market-ready skills. Six respondents (30%) indicated they will be attending a graduate or professional program in the upcoming academic year, and one will enroll in a post-baccalaureate research program before applying to a graduate/professional school. Five graduates (25%) had obtained employment in their STEM fields, while six students (30%) were still searching for such positions. Two (10%) were uncertain about their plans.

Eighteen of the 21 graduating seniors (86%) responded "Very Well" or "Extremely Well" regarding the extent that the LSAMP program at their institution was meeting the objective of increasing "the quality and quantity of students historically underrepresented in STEM who successfully complete baccalaureate degrees and continue on to graduate studies in STEM disciplines" (a substantial increase over 67% last year). Eighteen graduating seniors (90%) were open to being contacted by LSAMP staff about participating in future LSAMP activities to help support and inspire LSAMP Scholars.

Conclusions

Broad acknowledgement by URM students of the benefit of LSAMP's institutional and individualized supports confirms that The Ohio LSAMP Alliance continues to have strong, positive impacts on the target population. Numerous Level 1 Scholars expressed genuine appreciation for the LSAMP program, as exemplified in the comments of these two students:

> *The opportunities that have been made available to me through LSAMP have been priceless and I wouldn't trade them for anything.* **UC**

> *The reason I love being a part of LSAMP is that it not only supports minorities, but it focuses on supporting students on whatever is needed to continue their education.* **Cleveland State University**

The consistent pattern of sustained student engagement and participation combined with growing positive impacts are two of LSAMP's most striking accomplishments highlighted in this survey findings report. It is evident that the strategies and approaches LSAMP promotes are working. The 10 partners of the Ohio LSAMP Alliance are collaboratively meeting the grant's stated goals. It is highly recommended that each partner, and the alliance as a whole, explore ways to further institutionalize and expand on their successes to date. Doing so will help ensure that LSAMP's proven, effective programming at each institution is sustained and that more URM STEM students can benefit from it.